Re: U.S. Patent Application No. 10/572,643
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Our Ref.: 127380

Attached is a photograph of a UV (365nm) lamp turned on in a dark environment. The lamp itself appears purple. On top of the lamp were placed two PPV samples.

The area that appears green in the photograph is a sample made of poly(p-phenylenevinylene) (i.e. "PPV") having a thickness of about 70 nm. PPV is an unsubstituted π conjugated organic polymer compound. This PPV emits green light by absorbing the light from the UV lamp.

The sample appearing vermilion (red) is made of processed PPV prepared by contacting the PPV with penetrating DCM (4-dicyanomethylene-2-methyl-6(p-dimethylaminostylyl)-4H-pyran) vermilion color dye. This PPV was prepared by placing the PPV and DCM into a sealed container, elevating the temperature within the sealed container to 190˚C, and maintaining this temperature for a period of ***one minute***. As seen in the photograph, the processed PPV emits no green light at all, but only vermilion light.

When the surface of the PPV emitting vermilion light was wiped with cotton soaked in acetone, there were no changes in properties or evidence that any DCM was wiped away. From this, it could be understood that the DCM completely penetrates into the PPV.

DCM cannot be deposited using deposition in just one minute, nor can DCM fully penetrate into PPV by heating for a short period of time such as one minute after deposition. In fact, deposited material cannot generally completely penetrate, even after lengthy heating after deposition. Therefore, in Matsuo et al., (EP 1,143,773), the color layer consists of **two layers,** a deposit layer and a penetration layer

As stated above, the colour layer in the present invention is a **single layer** because dyes completely penetrate into an unsubstituted π conjugated organic polymer compound such as PPV.

Experimental Photograph

UV (365nm) Lamp

Green: Untreated PPV

Red: PPV penetrated with DCM